

1 **CLAIMS**

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3 1. A method, comprising:

4 providing an audio rendition manager having audio data processing
5 components to process audio data, the audio data processing components being
6 instantiated by the audio rendition manager as component objects having one or
7 more interfaces that are callable by an application program;

8 the audio rendition manager receiving a request from the application
9 program for a programming reference corresponding to an interface of one of the
10 instantiated audio data processing components; and

11 the audio rendition manager returning the requested programming reference
12 to the application program.

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14 2. A method as recited in claim 1, wherein said returning comprises
15 returning a memory address of a reference to the requested programming
16 reference.

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18 3. A method as recited in claim 1, wherein the audio rendition manager
19 is a component object having one or more interfaces that are callable by the
20 application program, and wherein said receiving comprises the application
21 program calling an interface method of the audio rendition manager.

1 4. A method as recited in claim 1, wherein said receiving comprises the
2 application program calling an interface method of the audio rendition manager,
3 and wherein the method further comprises determining the requested
4 programming reference with the audio rendition manager interface method.
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6 5. A method as recited in claim 1, wherein said providing comprises
7 instantiating the audio rendition manager as an object having one or more
8 interfaces, wherein said receiving comprises the application program calling an
9 interface method of the audio rendition manager, and wherein the method further
10 comprises determining the requested programming reference with the audio
11 rendition manager interface method.
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13 6. A method as recited in claim 1, wherein said receiving comprises the
14 application program calling an interface method of the audio rendition manager
15 and providing one or more interface method search parameters, and wherein the
16 method further comprises determining the requested programming reference with
17 the audio rendition manager interface method in accordance with the one or more
18 interface method search parameters.
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20 7. A method as recited in claim 1, wherein said receiving comprises the
21 application program calling an interface method of the audio rendition manager,
22 and wherein the method further comprises determining the requested
23 programming reference with an interface method search parameter that identifies
24 the particular one of the instantiated audio data processing components.
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1 8. A method as recited in claim 1, wherein said receiving comprises the
2 application program calling an interface method of the audio rendition manager,
3 and wherein the method further comprises determining the requested
4 programming reference with an interface method search parameter that is a
5 component identifier of one of the instantiated audio data processing components,
6 the search parameter having a value that identifies said component.

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8 9. A method as recited in claim 1, wherein said receiving comprises the
9 application program calling an interface method of the audio rendition manager,
10 and wherein the method further comprises determining the requested
11 programming reference with an interface method search parameter that is a
12 component identifier of one of the instantiated audio data processing components,
13 the search parameter having a value that identifies said component as a component
14 object having one or more audio data modifying components.

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16 10. A method as recited in claim 1, wherein said receiving comprises
17 the application program calling an interface method of the audio rendition
18 manager, and wherein the method further comprises determining the requested
19 programming reference with an interface method search parameter that is a
20 component identifier of one of the instantiated audio data processing components,
21 the search parameter having a value that identifies said component as an audio
22 sound wave data mixing component.

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1 11. A method as recited in claim 1, wherein said receiving comprises
2 the application program calling an interface method of the audio rendition
3 manager, and wherein the method further comprises determining the requested
4 programming reference with interface method search parameters, comprising:

5 a component identifier of one of the instantiated audio data processing
6 components, the search parameter having a value that identifies said component as
7 an audio buffer component that receives audio sound wave data from a plurality of
8 audio buffer components; and

9 an audio buffer identifier that identifies the audio buffer component.
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11 12. A method as recited in claim 1, wherein said receiving comprises
12 the application program calling an interface method of the audio rendition
13 manager, and wherein the method further comprises determining the requested
14 programming reference with interface method search parameters, comprising:

15 a component identifier of one of the instantiated audio data processing
16 components, the search parameter having a value that identifies said component as
17 an audio buffer component;

18 an audio buffer identifier that identifies the audio buffer component; and

19 an audio data channel identifier that identifies an audio data channel
20 corresponding to the audio buffer component.
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1 **13.** A method as recited in claim 1, wherein said receiving comprises
2 the application program calling an interface method of the audio rendition
3 manager, and wherein the method further comprises determining the requested
4 programming reference with interface method search parameters, comprising:

5 a component identifier of one of the instantiated audio data processing
6 components, the search parameter having a value that identifies said component as
7 an audio data modifying component;

8 an audio data channel identifier that identifies an audio data channel
9 corresponding to the audio data modifying component;

10 a component class identifier that identifies a component class
11 corresponding to the audio data modifying component; and

12 an index parameter that identifies the audio data modifying component in a
13 group of audio data modifying components that each correspond to the audio data
14 channel and to the audio data modifying component class.

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16 **14.** A method as recited in claim 1, wherein said receiving comprises
17 the application program calling an interface method of the audio rendition
18 manager, and wherein the method further comprises determining the requested
19 programming reference with interface method search parameters, comprising:

20 a component identifier of one of the instantiated audio data processing
21 components, the search parameter having a value that identifies said component as
22 a synthesizer component;

23 an audio data channel identifier that identifies an audio data channel
24 corresponding to the synthesizer component;

1 a component class identifier that identifies a component class
2 corresponding to the synthesizer component; and

3 an index parameter that identifies the synthesizer component in a group of
4 synthesizer components that each correspond to the audio data channel and to the
5 synthesizer component class.

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7 **15.** A method as recited in claim 1, wherein said receiving comprises
8 the application program calling an interface method of the audio rendition
9 manager, and wherein the method further comprises determining the requested
10 programming reference with interface method search parameters, comprising:

11 a component identifier of one of the instantiated audio data processing
12 components, the search parameter having a value that identifies said component as
13 an effects processor component in an audio buffer component that receives audio
14 sound wave data from a plurality of audio buffer components;

15 an audio buffer identifier that identifies the audio buffer component
16 corresponding to the effects processor component;

17 a component class identifier that identifies a component class
18 corresponding to the effects processor component; and

19 an index parameter that identifies the effects processor component in a
20 group of effects processor components that each correspond to the audio buffer
21 component and to the effects processor component class.

1 **16.** A method as recited in claim 1, wherein said receiving comprises
2 the application program calling an interface method of the audio rendition
3 manager, and wherein the method further comprises determining the requested
4 programming reference with interface method search parameters, comprising:

5 a component identifier of one of the instantiated audio data processing
6 components, the search parameter having a value that identifies said component as
7 an effects processor component in an audio buffer component;

8 an audio buffer identifier that identifies the audio buffer component
9 corresponding to the effects processor component;

10 an audio data channel identifier that identifies an audio data channel
11 corresponding to the effects processor component;

12 a component class identifier that identifies a component class
13 corresponding to the effects processor component; and

14 an index parameter that identifies the effects processor component in a
15 group of effects processor components that each correspond to the audio buffer
16 component, to the audio data channel, and to the effects processor component
17 class.

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19 **17.** One or more computer-readable media comprising computer-
20 executable instructions that, when executed, direct a computing system to perform
21 the method of claim 1.
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1 **18.** One or more computer-readable media comprising computer-
2 executable instructions that, when executed, direct a computing system to perform
3 the method of claim 4.

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5 **19.** One or more computer-readable media comprising computer-
6 executable instructions that, when executed, direct a computing system to perform
7 the method of claim 6.

8
9 **20.** A method, comprising:
10 providing a performance manager as an audio data processing component
11 having an interface that is callable by an application program;
12 the performance manager instantiating audio data processing components to
13 process audio data, each of the audio data processing components being
14 instantiated as a component object having an interface that is callable by the
15 application program, wherein the audio data processing components include an
16 audio content component that generates the audio data, and an audio rendition
17 manager corresponding to an audio rendition and processing the audio data to
18 render the corresponding audio rendition;
19 the audio content component receiving a request from the application
20 program for a programming reference corresponding to an interface of one of the
21 audio data processing components; and
22 the audio content component returning the requested programming
23 reference to the application program.
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1 **21.** A method as recited in claim 20, wherein said returning comprises
2 returning a memory address of a reference to the requested programming
3 reference.

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5 **22.** A method as recited in claim 20, wherein said receiving comprises
6 the application program calling an interface method of the audio content
7 component.

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9 **23.** A method as recited in claim 20, wherein said receiving comprises
10 the application program calling an interface method of the audio content
11 component, and wherein the method further comprises determining the requested
12 programming reference with the audio content component interface method.

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14 **24.** A method as recited in claim 20, wherein said receiving comprises
15 the application program calling an interface method of the audio content
16 component and providing one or more interface method search parameters, and
17 wherein the method further comprises determining the requested programming
18 reference with the audio content component interface method in accordance with
19 the one or more interface method search parameters.

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21 **25.** A method as recited in claim 20, wherein said receiving comprises
22 the application program calling an interface method of the audio content
23 component, and wherein the method further comprises determining the requested
24 programming reference with an interface method search parameter that identifies
25 the particular one of the audio data processing components.

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2 **26.** A method as recited in claim 20, wherein said receiving comprises
3 the application program calling an interface method of the audio content
4 component, and wherein the method further comprises determining the requested
5 programming reference with an interface method search parameter that is a
6 component identifier of one of the audio data processing components, the search
7 parameter having a value that identifies said component.

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9 **27.** A method as recited in claim 20, wherein said receiving comprises
10 the application program calling an interface method of the audio content
11 component, and wherein the method further comprises determining the requested
12 programming reference with an interface method search parameter that is a
13 component identifier of one of the audio data processing components, the search
14 parameter having a value that identifies the performance manager.

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16 **28.** A method as recited in claim 20, wherein said receiving comprises
17 the application program calling an interface method of the audio content
18 component, and wherein the method further comprises determining the requested
19 programming reference with an interface method search parameter that is a
20 component identifier of one of the audio data processing components, the search
21 parameter having a value that identifies the audio rendition manager.
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1 **29.** A method as recited in claim 20, wherein said receiving comprises
2 the application program calling an interface method of the audio content
3 component, and wherein the method further comprises determining the requested
4 programming reference with an interface method search parameter that is a
5 component identifier of one of the audio data processing components, the search
6 parameter having a value that identifies the audio content component.

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8 **30.** A method as recited in claim 20, wherein said receiving comprises
9 the application program calling an interface method of the audio content
10 component, and wherein the method further comprises determining the requested
11 programming reference with an interface method search parameter that is a
12 component identifier of one of the audio data processing components, the search
13 parameter having a value that identifies said component as an audio data
14 processing component having one or more audio data modifying components.

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16 **31.** A method as recited in claim 20, wherein said receiving comprises
17 the application program calling an interface method of the audio content
18 component, and wherein the method further comprises determining the requested
19 programming reference with interface method search parameters, comprising:

20 a component identifier of one of the audio data processing components, the
21 search parameter having a value that identifies said component as an audio data
22 modifying component;

23 an audio data channel identifier that identifies an audio data channel
24 corresponding to the audio data modifying component;
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1 a component class identifier that identifies a component class
2 corresponding to the audio data modifying component; and

3 an index parameter that identifies the audio data modifying component in a
4 group of audio data modifying components that each correspond to the audio data
5 channel and to the audio data modifying component class.

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7 **32.** A method as recited in claim 20, wherein said receiving comprises
8 the application program calling an interface method of the audio content
9 component, and wherein the method further comprises determining the requested
10 programming reference with interface method search parameters, comprising:

11 a component identifier of one of the audio data processing components, the
12 search parameter having a value that identifies said component as an audio data
13 processing component in the audio content component that said generates the
14 audio data;

15 a component class identifier that identifies a component class
16 corresponding to the audio data processing component in the audio content
17 component; and

18 an index parameter that identifies the audio data processing component in a
19 group of audio data processing components that each correspond to the component
20 class.

21
22 **33.** A method, comprising:

23 providing an audio rendition manager having audio data processing
24 components to process audio data;

1 requesting a reference corresponding to an interface of one of the audio
2 data processing components, the audio rendition manager receiving the request
3 and determining the requested reference; and

4 receiving the requested reference from the audio rendition manager.
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6 **34.** A method as recited in claim 33, wherein said receiving the
7 requested reference comprises receiving a memory address of a reference
8 identifier that identifies the requested reference.
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10 **35.** A method as recited in claim 33, wherein said requesting comprises
11 an application program calling an interface method of the audio rendition
12 manager.
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14 **36.** A method as recited in claim 33, wherein said requesting comprises
15 an application program calling an interface method of the audio rendition
16 manager, and wherein said determining comprises determining the requested
17 reference with the audio rendition manager interface method.
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19 **37.** A method as recited in claim 33, wherein said providing comprises
20 instantiating the audio rendition manager as a component object having one or
21 more interfaces, wherein said requesting comprises an application program calling
22 an interface method of the audio rendition manager, and wherein said determining
23 comprises determining the requested reference with the audio rendition manager
24 interface method.
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1 **38.** A method as recited in claim 33, wherein said requesting comprises
2 an application program calling an interface method of the audio rendition manager
3 and providing one or more interface method search parameters, and wherein said
4 determining comprises determining the requested reference with the audio
5 rendition manager interface method in accordance with the one or more interface
6 method search parameters.

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8 **39.** A method as recited in claim 33, wherein said requesting comprises
9 an application program calling an interface method of the audio rendition
10 manager, and wherein said determining comprises determining the requested
11 reference with an interface method search parameter that identifies the particular
12 one of the audio data processing components.

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14 **40.** A method as recited in claim 33, wherein said requesting comprises
15 the application program calling an interface method of the audio rendition
16 manager, and wherein said determining comprises determining the requested
17 reference with an interface method search parameter that is a component identifier
18 of one of the audio data processing components, the search parameter having a
19 value that identifies said component as an audio buffer component.
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1 **41.** A method as recited in claim 33, wherein said requesting comprises
2 the application program calling an interface method of the audio rendition
3 manager, and wherein said determining comprises determining the requested
4 reference with an interface method search parameter that is a component identifier
5 of one of the audio data processing components, the search parameter having a
6 value that identifies said component as a synthesizer component.

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8 **42.** One or more computer-readable media comprising computer-
9 executable instructions that, when executed, direct a computing system to perform
10 the method of claim 33.

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12 **43.** One or more computer-readable media comprising computer-
13 executable instructions that, when executed, direct a computing system to perform
14 the method of claim 36.

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16 **44.** One or more computer-readable media comprising computer-
17 executable instructions that, when executed, direct a computing system to perform
18 the method of claim 38.

1 **45.** A computer programmed to perform a method, comprising:
2 instantiating a data manager as a programming object to manage processing
3 data, the data manager having an interface that is callable by an application
4 program;

5 the data manager performing acts comprising:

6 instantiating one or more data processing components as
7 programming objects that process the data, each data processing component
8 having an interface that is callable by the application program;

9 receiving a request for a programming reference corresponding to an
10 interface of one of the instantiated data processing components, the request
11 being received from the application program as a call to an interface
12 method of the data manager interface;

13 determining the requested programming reference with the data
14 manager interface method; and

15 returning the requested programming reference to the application
16 program.

17
18 **46.** A method as recited in claim 45, wherein the data manager is an
19 audio rendition manager that corresponds to an audio rendition, and wherein the
20 data processing components process the data to render the corresponding audio
21 rendition.

1 **47.** A method as recited in claim 45, wherein the data manager is a
2 performance manager having the one or more data processing components that
3 said process the data to generate audio instructions, and the method further
4 comprising instantiating an audio rendition manager that corresponds to an audio
5 rendition, the audio rendition manager processing the audio instructions to render
6 the corresponding audio rendition.

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8 **48.** A method as recited in claim 45, wherein said returning the
9 requested programming reference comprises returning a memory address of a
10 reference to the requested programming reference.

11
12 **49.** A method as recited in claim 45, wherein said determining
13 comprises determining the requested programming reference with an interface
14 method search parameter that identifies the particular one of the instantiated data
15 processing components.

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17 **50.** A method as recited in claim 45, wherein said determining
18 comprises determining the requested programming reference with an interface
19 method search parameter that is a component identifier of one of the instantiated
20 audio data processing components, the search parameter having a value that
21 identifies said component as an audio buffer component.

1 **51.** A method as recited in claim 45, wherein said determining
2 comprises determining the requested programming reference with an interface
3 method search parameter that is a component identifier of one of the instantiated
4 audio data processing components, the search parameter having a value that
5 identifies said component as a synthesizer component.

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7 **52.** One or more computer-readable media comprising computer-
8 executable instructions that, when executed, direct a computing system to perform
9 the method of claim 45.

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11 **53.** One or more computer-readable media comprising computer-
12 executable instructions that, when executed, direct a computing system to perform
13 the method of claim 46.

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15 **54.** One or more computer-readable media comprising computer-
16 executable instructions that, when executed, direct a computing system to perform
17 the method of claim 47.

1 **55.** An audio generation system, comprising:
2 an audio rendition manager configured to receive audio instructions from
3 one or more sources;
4 one or more audio instruction processing components configured to process
5 the audio instructions, the audio instruction processing components provided by
6 the audio rendition manager;
7 an application program configured to request a reference corresponding to
8 one of the audio instruction processing components by initiating that the audio
9 rendition manager determine the requested reference and return the requested
10 reference to the application program.
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12 **56.** An audio generation system as recited in claim 55, wherein the
13 application program is configured to request the reference by providing one or
14 more search parameters, and wherein the audio rendition manager is configured to
15 determine the requested reference in accordance with the one or more search
16 parameters.
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18 **57.** An audio generation system as recited in claim 55, wherein the
19 audio rendition manager is configured to determine the requested reference with a
20 search parameter that identifies the particular one of the audio instruction
21 processing components.
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1 **58.** An audio generation system as recited in claim 55, wherein the
2 audio rendition manager is configured to determine the requested reference with a
3 search parameter that is a component identifier of one of the audio instruction
4 processing components, the search parameter having a value that identifies said
5 component.

6
7 **59.** An audio generation system as recited in claim 55, wherein the
8 audio rendition manager is configured to determine the requested reference with a
9 search parameter that is a component identifier of one of the audio instruction
10 processing components, the search parameter having a value that identifies said
11 component as having one or more audio instruction modifying components.

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13 **60.** An audio generation system as recited in claim 55, wherein the
14 audio rendition manager is configured to determine the requested reference with a
15 search parameter that is a component identifier of one of the audio instruction
16 processing components, the search parameter having a value that identifies said
17 component as an audio instruction mixing component.

1 **61.** An audio generation system as recited in claim 55, wherein the
2 audio rendition manager is configured to determine the requested reference with
3 search parameters, comprising:

4 a component identifier of one of the audio instruction processing
5 components, the search parameter having a value that identifies said component as
6 an audio buffer component that receives audio instructions from a plurality of
7 audio buffer components; and

8 an audio buffer identifier that identifies the audio buffer component.
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10 **62.** An audio generation system as recited in claim 55, wherein the
11 audio rendition manager is configured to determine the requested reference with
12 search parameters, comprising:

13 a component identifier of one of the audio instruction processing
14 components, the search parameter having a value that identifies said component as
15 an audio buffer component;

16 an audio buffer identifier that identifies the audio buffer component; and

17 an audio instructions channel identifier that identifies an audio instructions
18 channel corresponding to the audio buffer component.
19

20 **63.** An audio generation system as recited in claim 55, wherein the
21 audio rendition manager is configured to determine the requested reference with
22 search parameters, comprising:

23 a component identifier of one of the audio instruction processing
24 components, the search parameter having a value that identifies said component as
25 an audio instructions modifying component;

1 an audio instructions channel identifier that identifies an audio instructions
2 channel corresponding to the audio instructions modifying component;

3 a component class identifier that identifies a component class
4 corresponding to the audio instructions modifying component; and

5 an index parameter that identifies the audio instructions modifying
6 component in a group of audio instructions modifying components that each
7 correspond to the audio instructions channel and to the audio instructions
8 modifying component class.

9
10 **64.** An audio generation system as recited in claim 55, wherein the
11 audio rendition manager is configured to determine the requested reference with
12 search parameters, comprising:

13 a component identifier of one of the audio instruction processing
14 components, the search parameter having a value that identifies said component as
15 a synthesizer component;

16 an audio instructions channel identifier that identifies an audio instructions
17 channel corresponding to the synthesizer component;

18 a component class identifier that identifies a component class
19 corresponding to the synthesizer component; and

20 an index parameter that identifies the synthesizer component in a group of
21 synthesizer components that each correspond to the audio instructions channel and
22 to the synthesizer component class.

1 65. An audio generation system as recited in claim 55, wherein the
2 audio rendition manager is configured to determine the requested reference with
3 search parameters, comprising:

4 a component identifier of one of the audio instruction processing
5 components, the search parameter having a value that identifies said component as
6 an effects processor component in an audio buffer component that receives audio
7 instructions from a plurality of audio buffer components;

8 an audio buffer identifier that identifies the audio buffer component
9 corresponding to the effects processor component;

10 a component class identifier that identifies a component class
11 corresponding to the effects processor component; and

12 an index parameter that identifies the effects processor component in a
13 group of effects processor components that each correspond to the audio buffer
14 component and to the effects processor component class.

15
16 66. An audio generation system as recited in claim 55, wherein the
17 audio rendition manager is configured to determine the requested reference with
18 search parameters, comprising:

19 a component identifier of one of the audio instruction processing
20 components, the search parameter having a value that identifies said component as
21 an effects processor component in an audio buffer component;

22 an audio buffer identifier that identifies the audio buffer component
23 corresponding to the effects processor component;

24 an audio instructions channel identifier that identifies an audio instructions
25 channel corresponding to the effects processor component;

1 a component class identifier that identifies a component class
2 corresponding to the effects processor component; and

3 an index parameter that identifies the effects processor component in a
4 group of effects processor components that each correspond to the audio buffer
5 component, to the audio instructions channel, and to the effects processor
6 component class.

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8 **67.** An audio generation system as recited in claim 55, further
9 comprising:

10 a performance manager configured to receive audio content from one or
11 more sources and process event instructions to produce the audio instructions;

12 an audio content component configured to generate the event instructions
13 from the received audio content, wherein the performance manager provides the
14 audio content component;

15 wherein the application program is further configured to request a reference
16 corresponding to the performance manager by initiating that the audio content
17 component determine the requested reference with a search parameter having a
18 value that identifies the performance manager, and return the requested reference
19 to the application program.

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21 **68.** An audio generation system as recited in claim 55, further
22 comprising:

23 a performance manager configured to receive audio content from one or
24 more sources and process event instructions to produce the audio instructions;

1 an audio content component configured to generate the event instructions
2 from the received audio content, wherein the performance manager provides the
3 audio content component;

4 wherein the application program is further configured to request a reference
5 corresponding to the audio rendition manager by initiating that the audio content
6 component determine the requested reference with a search parameter having a
7 value that identifies the audio rendition manager, and return the requested
8 reference to the application program.

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10 **69.** An audio generation system as recited in claim 55, further
11 comprising:

12 a performance manager configured to receive audio content from one or
13 more sources and process event instructions to produce the audio instructions;

14 an audio content component configured to generate the event instructions
15 from the received audio content, wherein the performance manager provides the
16 audio content component;

17 wherein the application program is further configured to request a reference
18 corresponding to the audio content component by initiating that the audio content
19 component determine the requested reference with a search parameter having a
20 value that identifies the audio content component, and return the requested
21 reference to the application program.

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23 **70.** An audio generation system as recited in claim 55, further
24 comprising:
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1 a performance manager configured to receive audio content from one or
2 more sources and process event instructions to produce the audio instructions;

3 one or more audio content components configured to generate the event
4 instructions from the received audio content, wherein the performance manager
5 provides an audio content component for each source of audio content;

6 one or more event instruction modifiers configured to modify the event
7 instructions, each event instruction modifier corresponding to an audio content
8 component, wherein the performance manager provides the event instruction
9 modifiers; and

10 wherein the application program is further configured to request a reference
11 corresponding to an event instruction modifier by initiating that the corresponding
12 audio content component determine the requested reference and return the
13 requested reference to the application program.

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15 **71.** An audio generation system as recited in claim 55, further
16 comprising:

17 a performance manager configured to process event instructions to produce
18 the audio instructions;

19 one or more audio content components configured to receive audio content
20 from one or more sources, wherein the performance manager provides an audio
21 content component for each source of audio content;

22 one or more event instruction components configured to generate the event
23 instructions from the received audio content, each event instruction component
24 corresponding to an audio content component, wherein the performance manager
25 provides the event instruction components; and

1 wherein the application program is further configured to request a reference
2 corresponding to an event instruction component by initiating that the
3 corresponding audio content component determine the requested reference and
4 return the requested reference to the application program.
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